

Hangar 1 Rehabilitation Project Consulting Parties Presentation

June 3, 2020



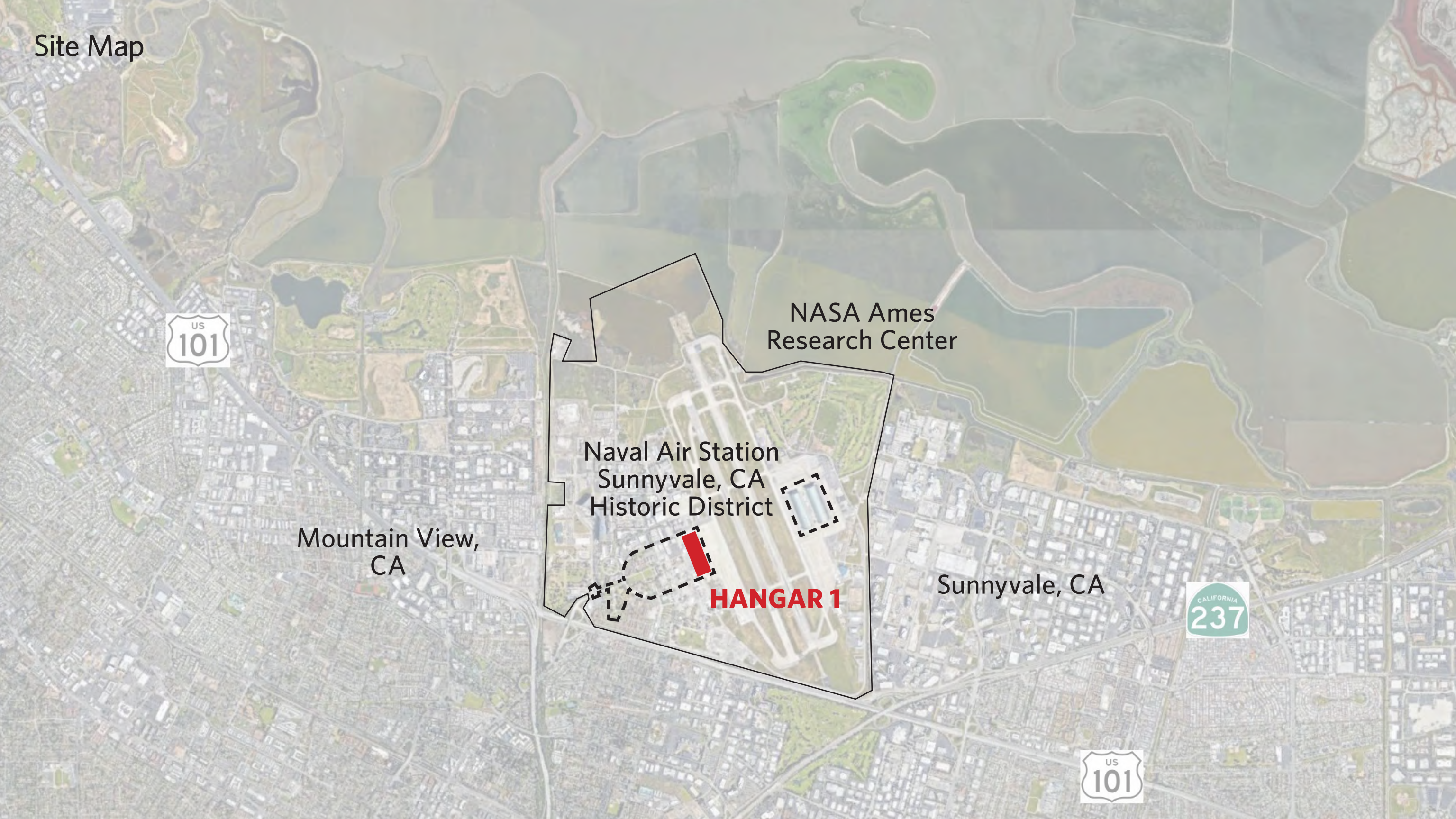
Hangar 1 Rehabilitation Project, Consulting Parties Presentation Agenda

- Consulting Parties Presentation Intro
- Rehabilitation Project Introduction
- Rehabilitation Approach and Goals
- Exterior Reclad Approach, Shenandoah Plaza
- Exterior Reclad Approach, Airfield

- Interior Rehabilitation Approach
- Interior Illumination Rehabilitation Approach
- Building Performance: Daylighting and Glare
- Comparative Images: Historic and Proposed
- Comments and Questions

Project Introduction

Site Map



NASA Ames
Research Center

Naval Air Station
Sunnyvale, CA
Historic District

Mountain View,
CA

HANGAR 1

Sunnyvale, CA



Naval Air Station Sunnyvale, CA Historic District

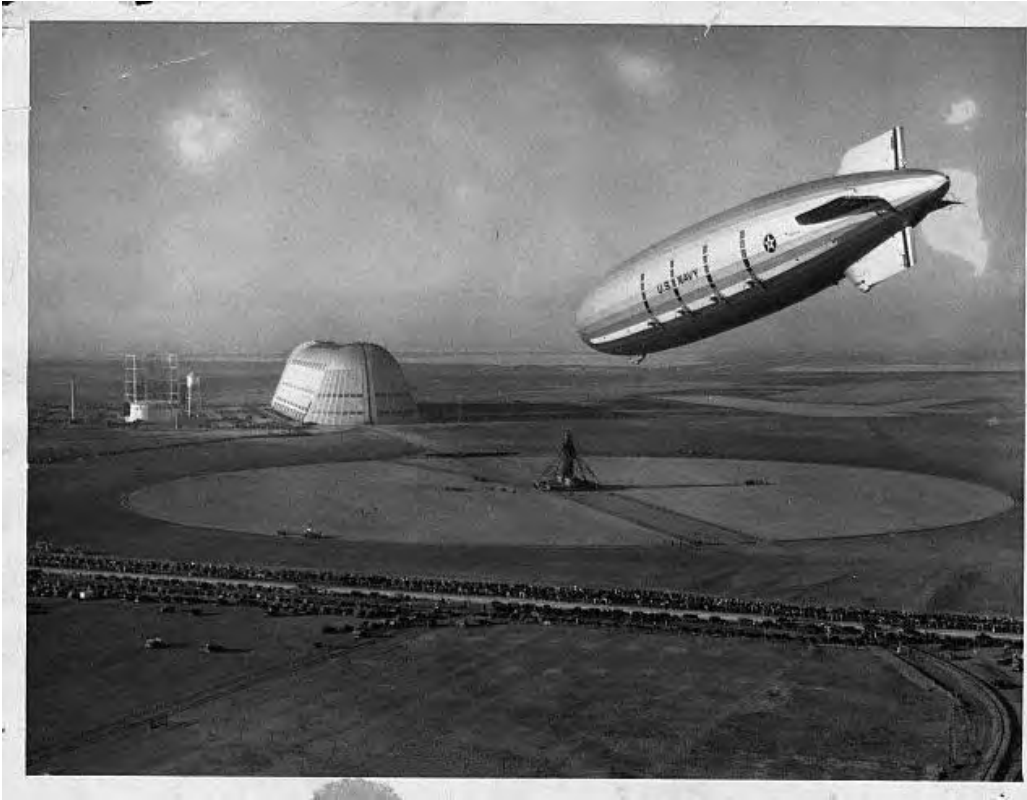


- Listed in the NRHP 1994
- Listing includes Shenandoah Plaza Campus and Hangars 1-3

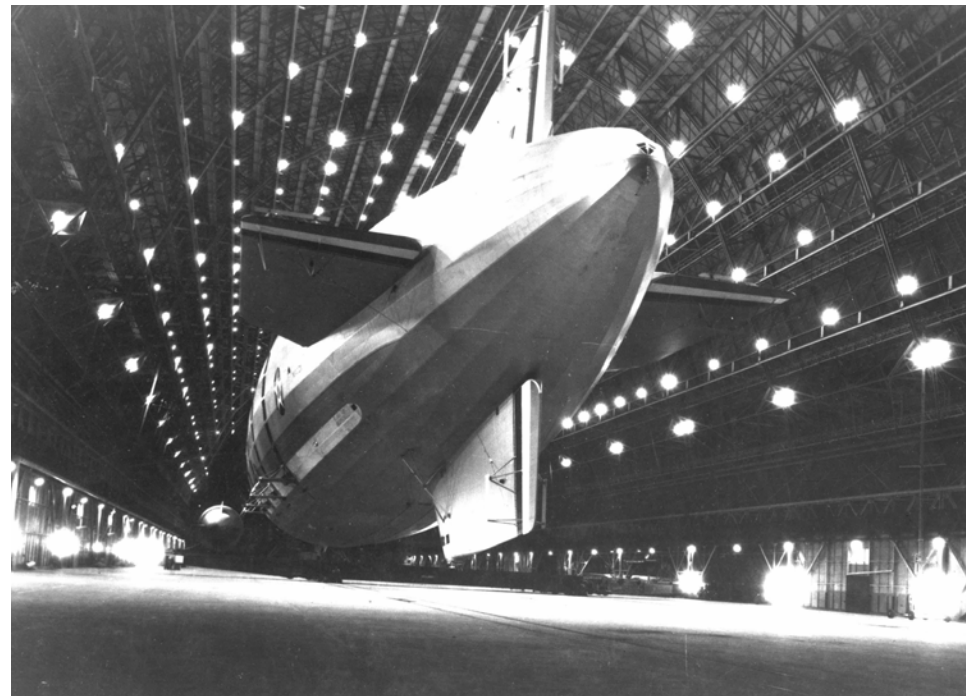
- Expanded District boundary, 2013



Hangar 1, Buildings 032 and 033



- Hangar 1: 1933
- Buildings 032 and 033: 1934



Hangar 1 Rehabilitation Approach and Goals

Secretary of the Interiors Standards Conformance

Hangar 1

- Abatement
- Seismic strengthening
- Re-clad
- Interior Improvements
- Infrastructure Improvements and Limited Site Work

B032 and 033

- Repair and Maintenance



Abatement



Structural Strengthening Approach

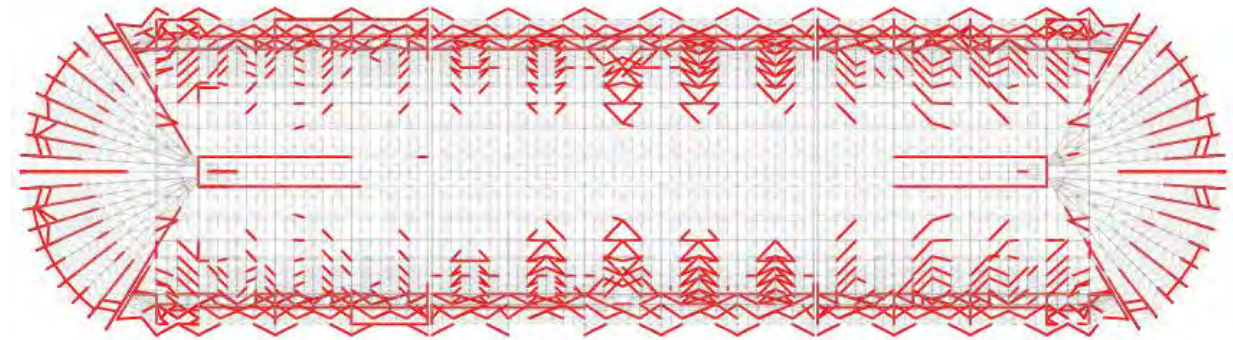
Intent: The design intent is to maintain loads that were historically present.

Structural condition assessment: Where no distress is evident and if the dead and live loads will not exceed those historically present, the structure may be deemed adequate.

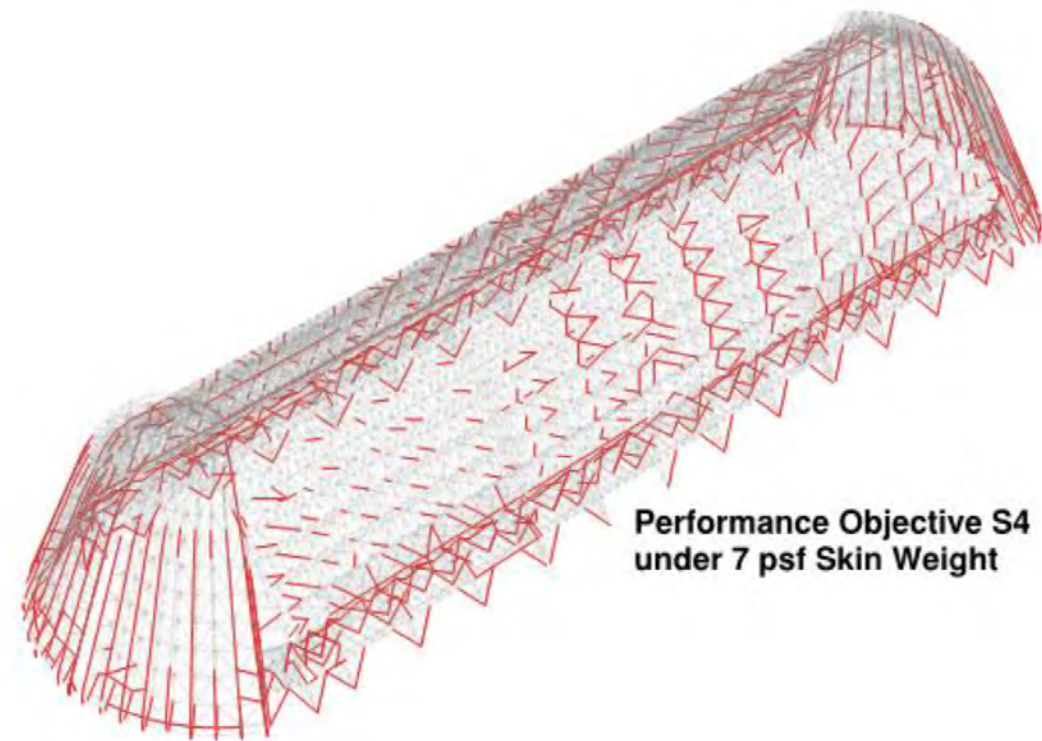
Proposed rehabilitation action: Where loads exceed those historically present the provisions of CEBC Section 403 for Alterations would apply.

estimated number of
members to be strengthened:
approximately 4,200 out of 56,500
projected percentage of
members to be strengthened:
>1%

Typical Original V-Beam
Horizontal Joint



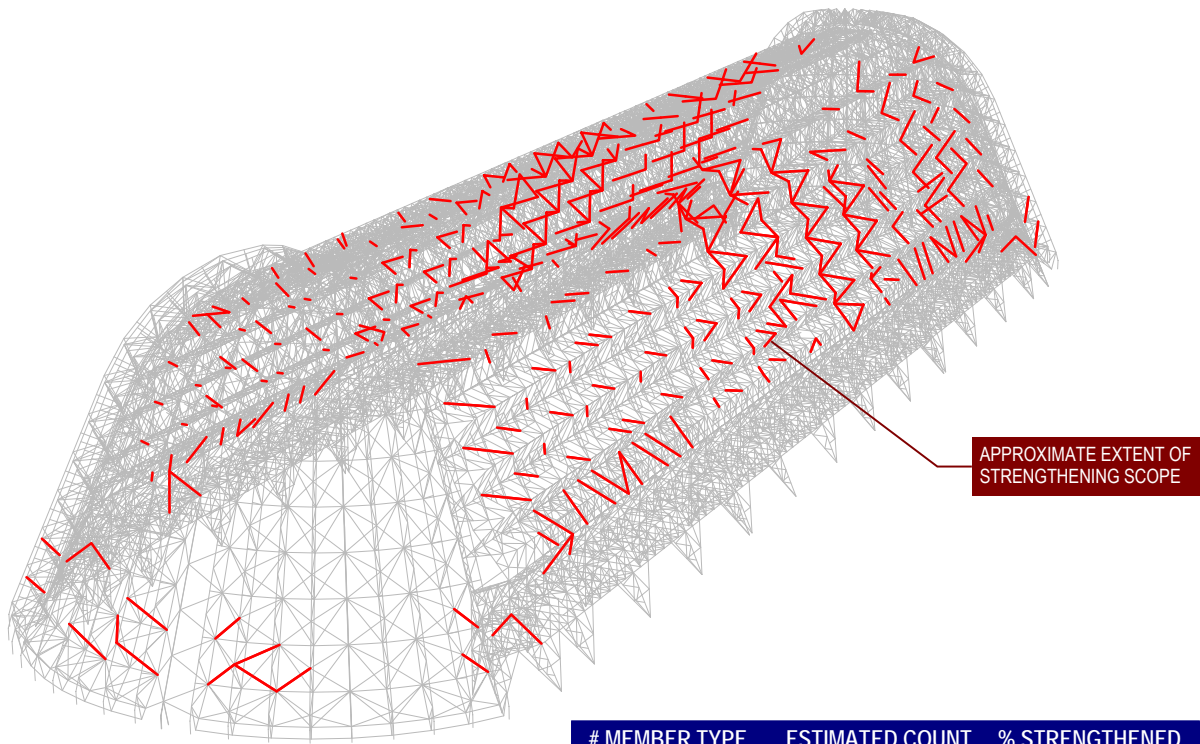
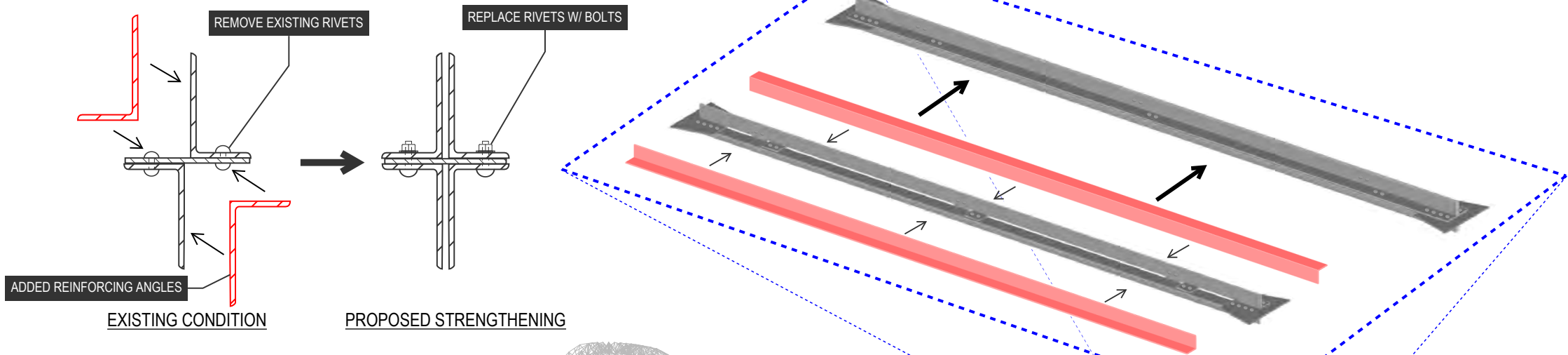
Performance Objective S4 under 7 psf Skin Weight



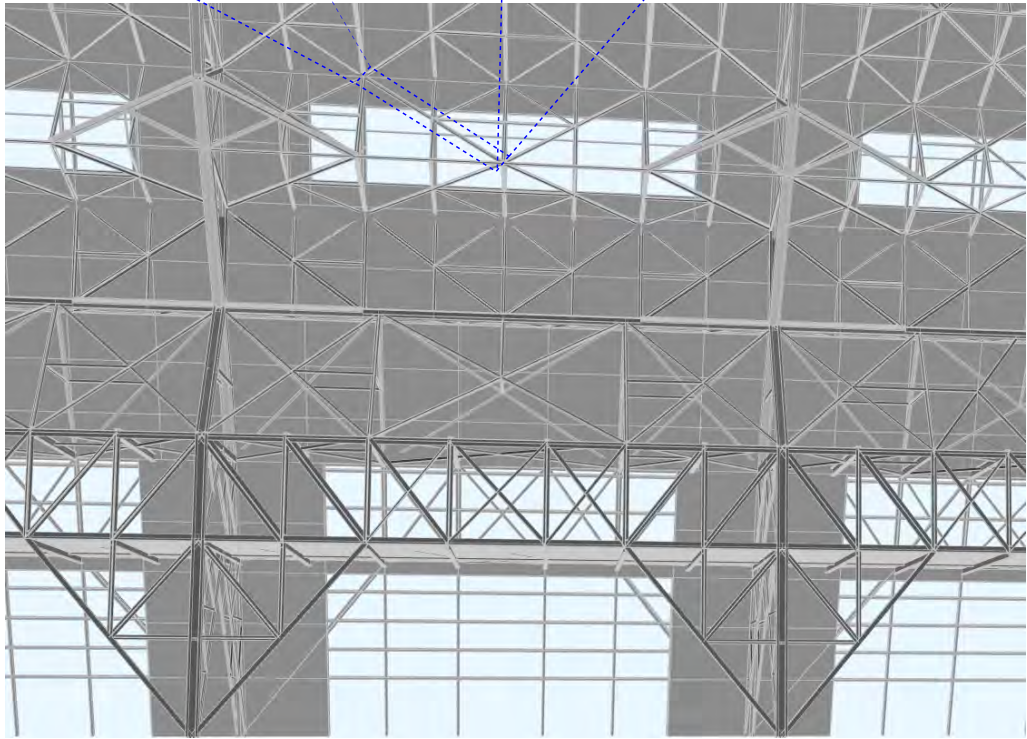
Performance Objective S4
under 7 psf Skin Weight

Proposed Typical Strengthening Detail: Double Angle

CONCEPTUAL STRUCTURAL STRENGTHENING



# MEMBER TYPE	ESTIMATED COUNT	% STRENGTHENED
13,200 TOTAL	650	5%



Original Hangar 1 Cladding Attributes

Built-up Roof:
Dark gray,
smooth

**Roof Monitor
Walk, Roof Vent:**
Low-profile metal
enclosure

Mansard:
Lightly textured, scale
slightly larger than
adjacent V-Beam panel;
dull aluminum finish

V-Beam Wall:
Taut, metallic, uniform
panel system,
"Dull Aluminum" finish

Stacked Strip Windows:
Top-tiers: textured panel,
vertical expression
Bottom-Tiers: flat panel,
horizontal expression

The Project will replicate, as closely as possible,
the overall visual characteristics of the original cladding

Original Hangar 1 Performance Deficiencies for Potential Future Tenant Uses

Thermal performance and condensation:
Uninsulated roof systems

Occupant experience:
High solar heat gain @ West windows

Ventilation openings:
insufficient for primarily human occupation

Water air permeability:
BUR and Mansard Roof

Interior illumination:
Low daylighting level and point glare

Thermal:
Consistently low temps, especially in mornings

Acoustics:
High transmission from exterior / high reverberation at interior

Performance deficiencies of original systems whose replication would risk damage to historic fabric and impede operational capability sufficient for potential future tenant uses

Hangar 1 Performance Improvements for Potential Future Tenant Uses

Thermal performance and condensation:
Roof insulation

Occupant experience:
Insulated or coated glazing panels

Ventilation openings:
Intake and exhaust at roof, at existing window openings

Water air permeability:
Membrane roofing over steel decking

Built to purpose low slope roofing system

Occupant experience:
More and better-distributed daylighting

Thermal:
Larger window openings, targeted morning solar heat gain

Acoustics:
Improved facade performance

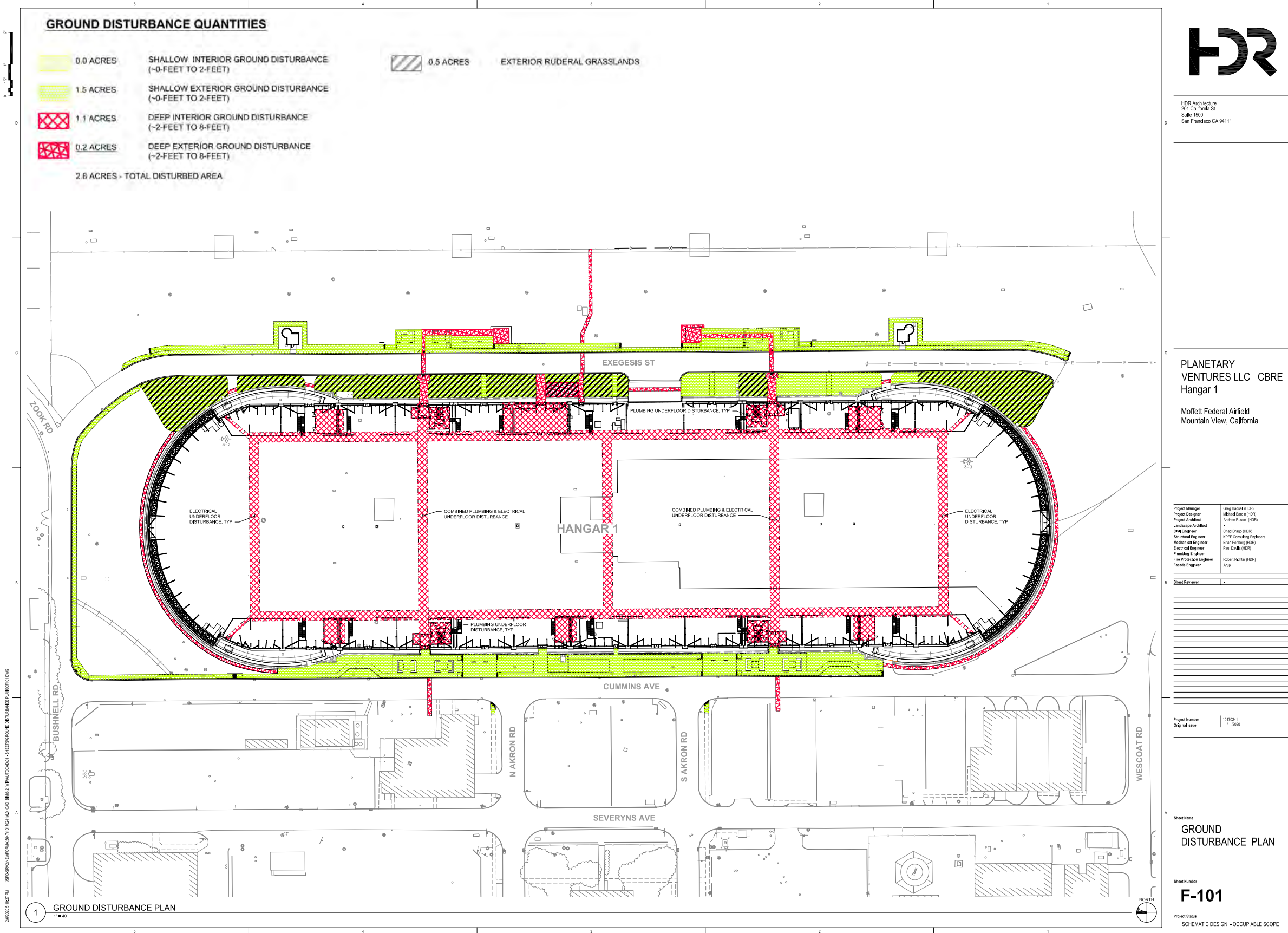
Performance improvements including adequate waterproofing, tempered interior, and daylighting to help conserve historic fabric, and to improve interior environment for potential future tenant uses

The following content was redacted from this public posting:

Areas of Archaeological Sensitivity

Hangar 1 Ground Disturbance

- Disturbance exterior and adjacent to Hangar primarily shallow (~0 - 2 feet deep)
- Deep disturbance (~2 - 8 feet deep) almost entirely within Hangar interior, at previously disturbed locations



Hangar 1 Exterior Reclad Approach, Shenandoah Plaza

Historic Image: Shenandoah Plaza



Proposed View from Shenandoah Plaza



The original fenestration pattern will be retained, and window openings will remain in their original locations and sizes

Proposed View from Shenandoah Plaza

The original fenestration pattern will be retained, and window openings will remain in their original locations and sizes



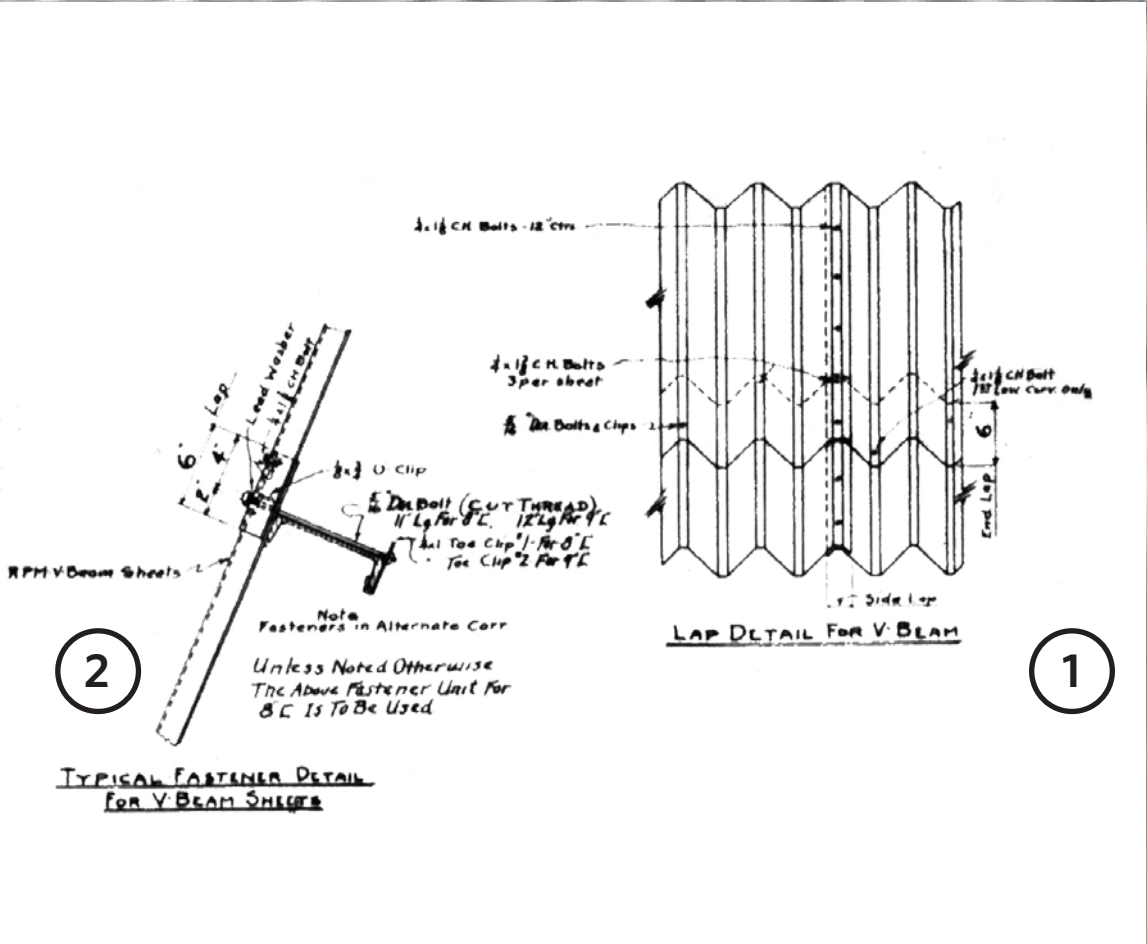
Typical Original Metal V-Beam Wall Siding Details

Typical Original V-Beam
Horizontal Joint

1

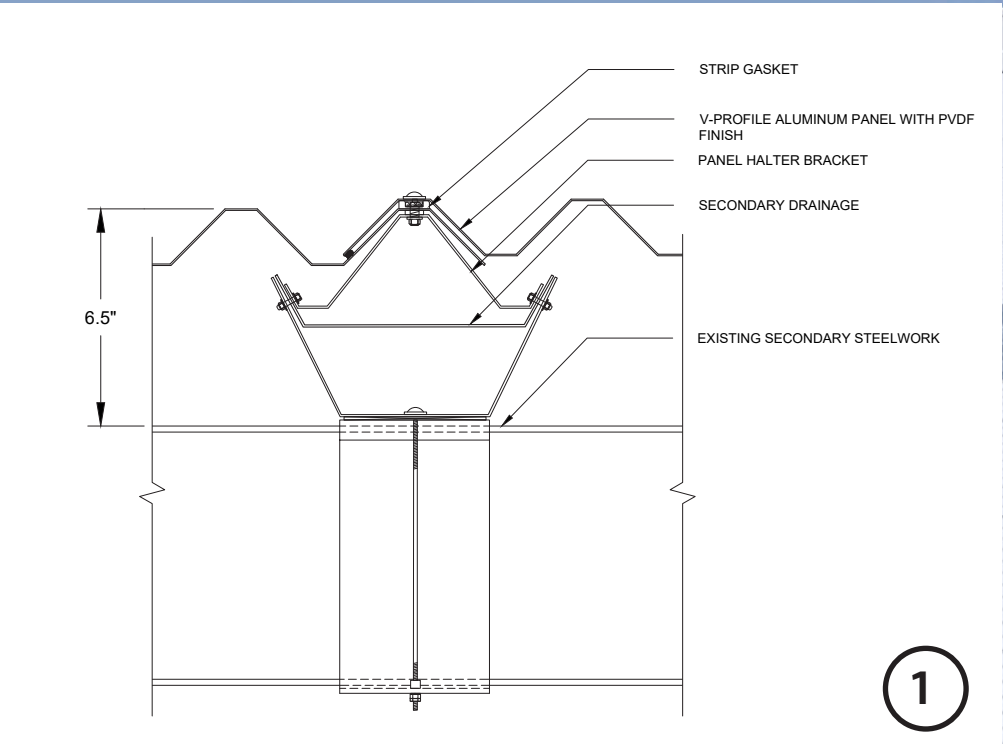
Typical Original
V-Beam Vertical Joint

2

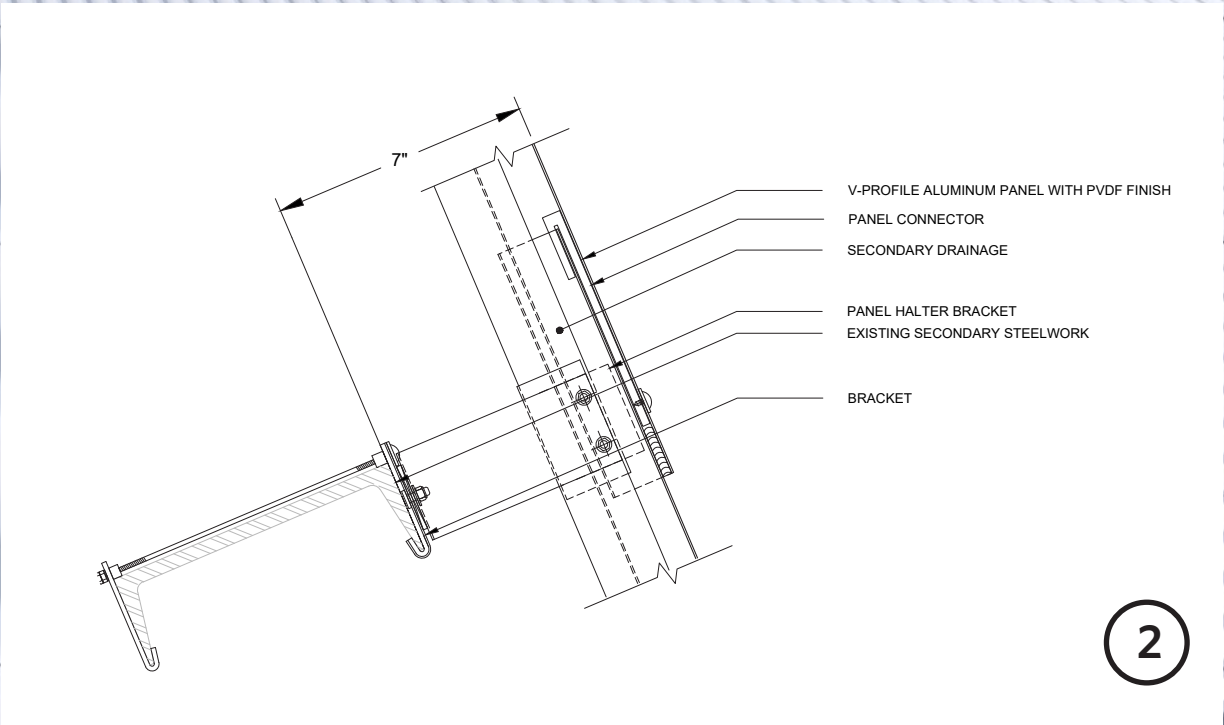


Proposed Typical Metal V-Beam Wall Siding Details

Typical Original V-Beam
Horizontal Joint ①



Typical Original
V-Beam Vertical Joint ②

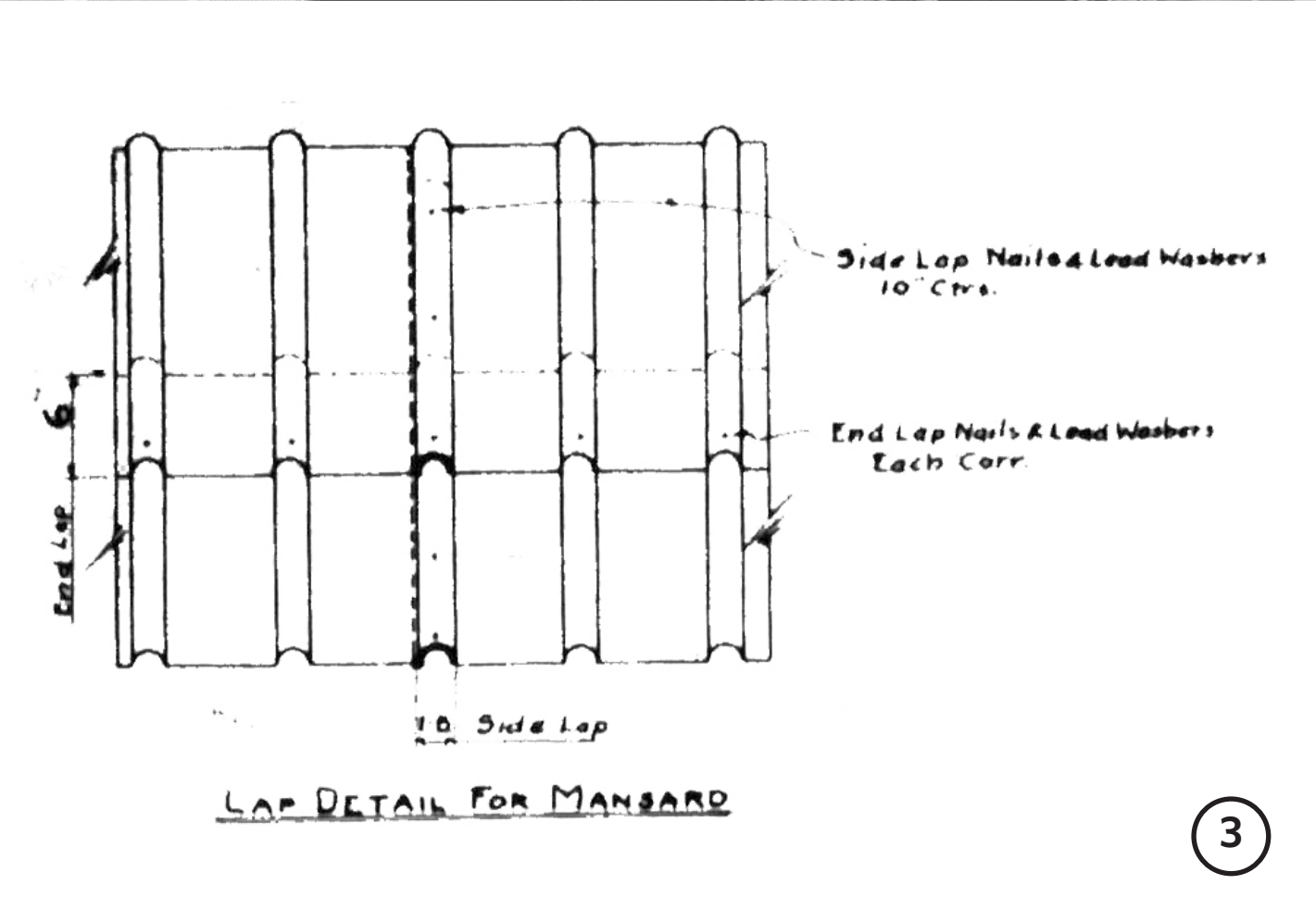


The new aluminum wall siding will retain the shape and profile of the original

Original Mansard Siding Details

Original
Typical
Mansard
Detail

3

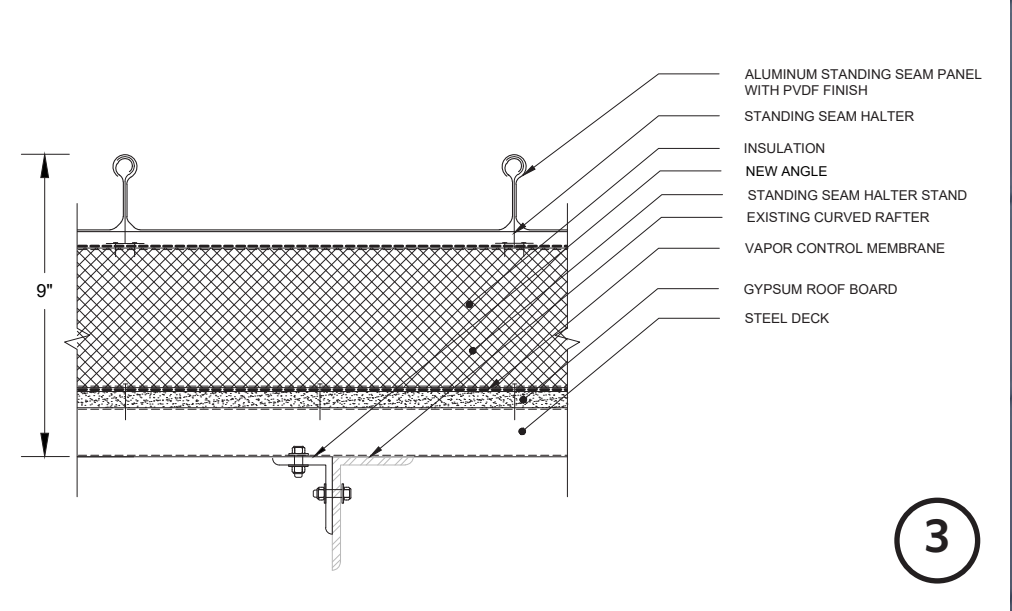


Proposed Typical Mansard Siding Details

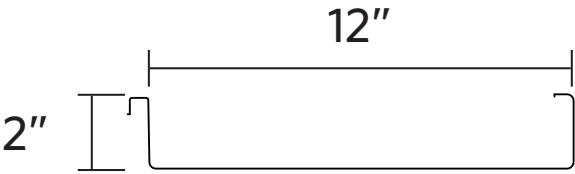
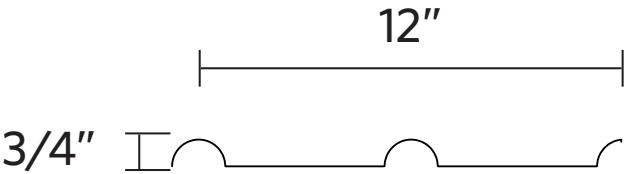
Proposed Typical Mansard Detail

3

New Mansard siding will be a sheet standing seam product with the seam size and spacing reflecting a similar character to the original with a smooth surface and regular pattern of seams



Comparison of Original and Proposed Mansard Siding Profiles



Hangar 1 Exterior Reclad Approach, Airfield

Historic Image: Airfield Side



Proposed View from Airfield Side

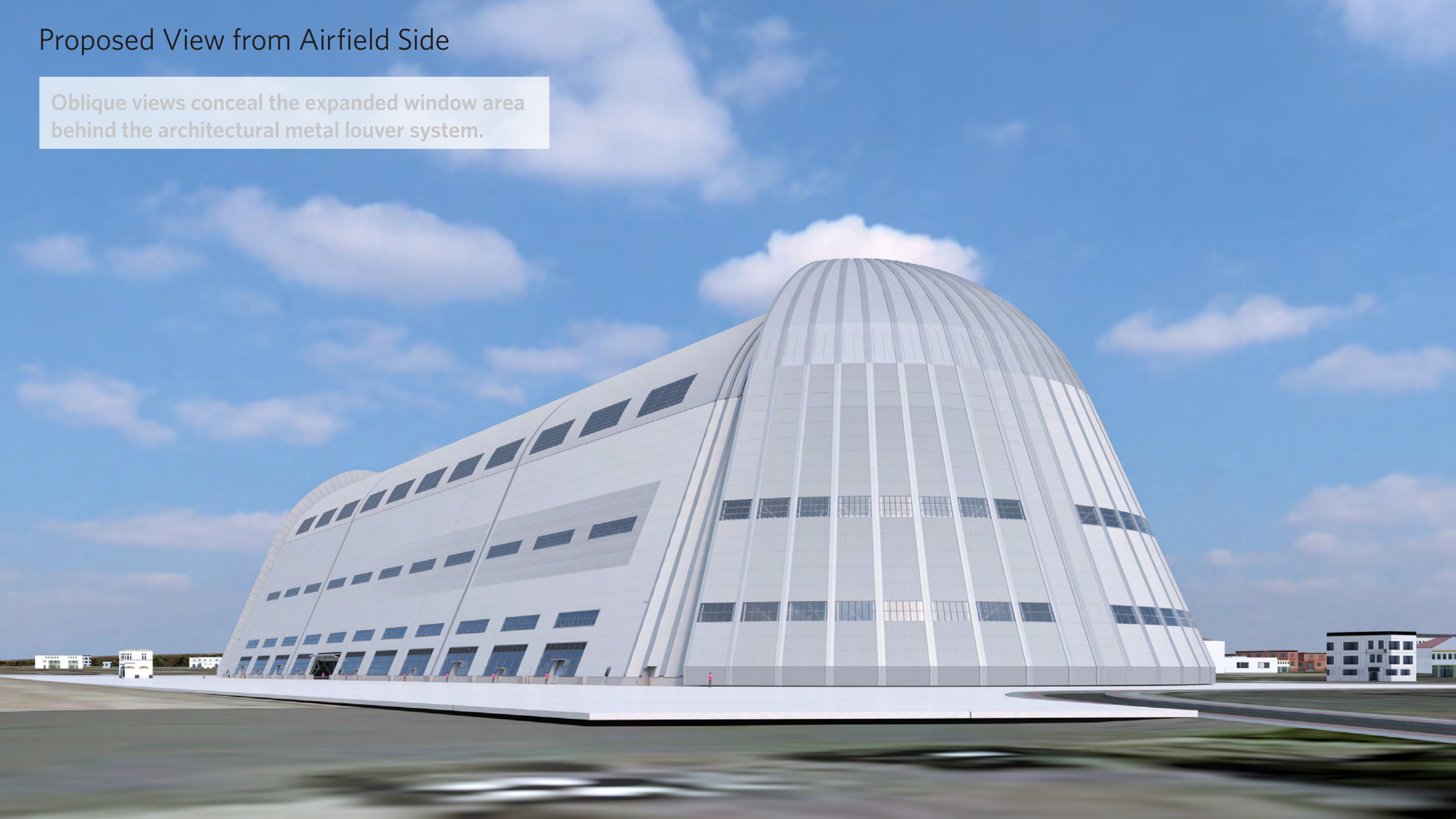
Airfield side historic openings will be retained within an expanded window area.

An architectural metal louver system is designed to visually integrate the enlarged glazed opening with the surrounding profiled metal panels in order to minimize visual impact, and which becomes less visible as the view becomes more oblique



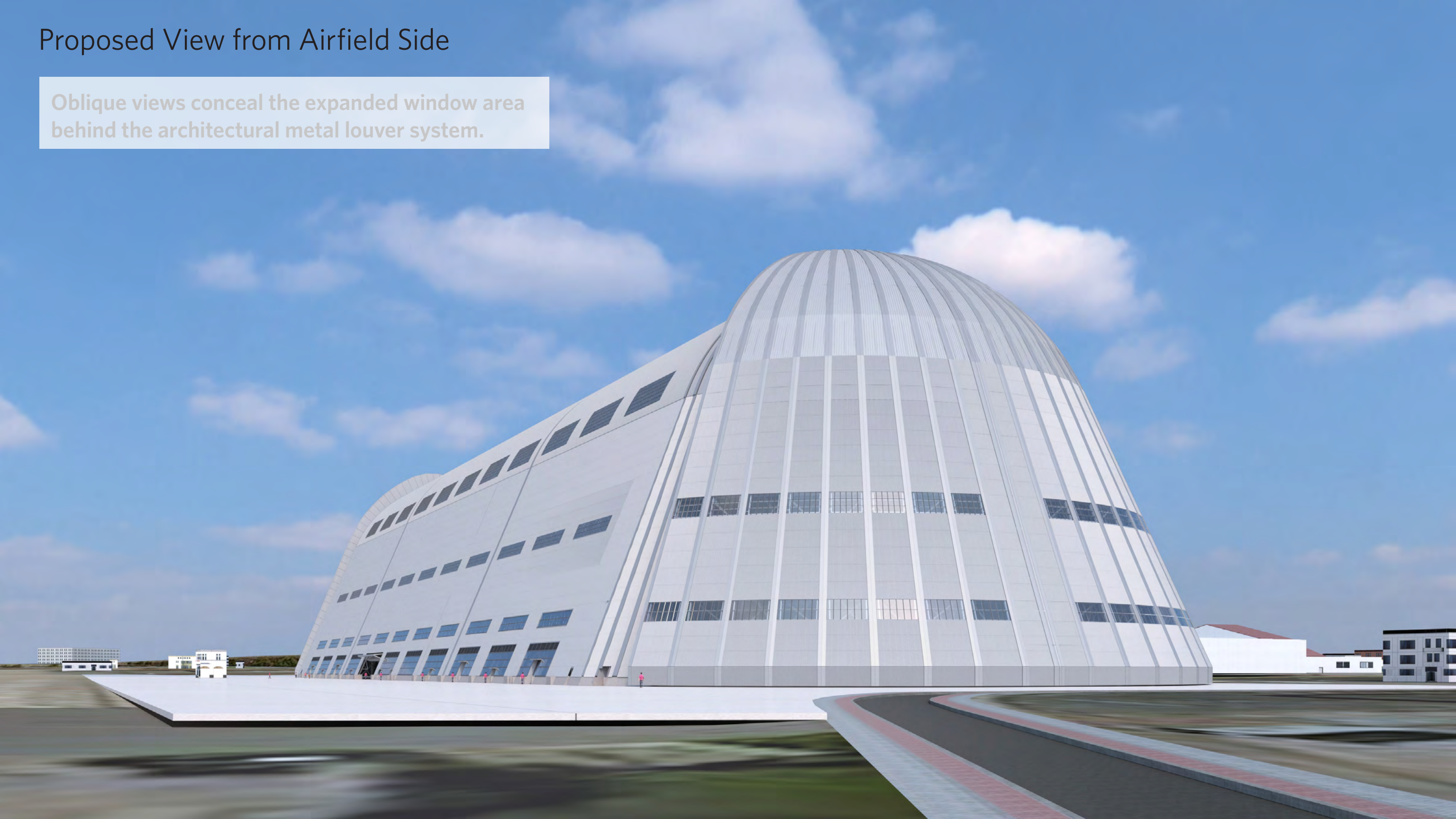
Proposed View from Airfield Side

Oblique views conceal the expanded window area behind the architectural metal louver system.

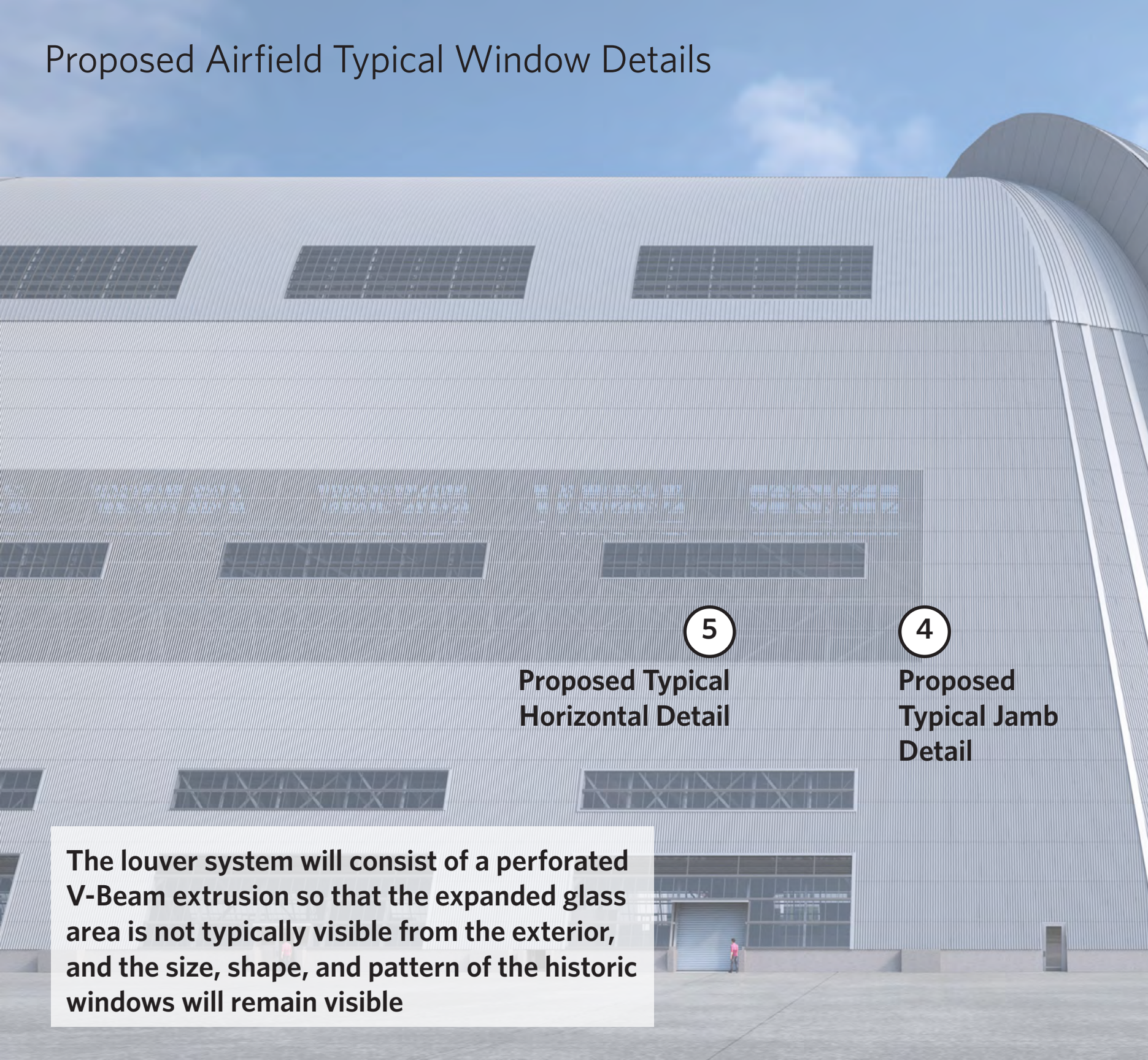


Proposed View from Airfield Side

Oblique views conceal the expanded window area behind the architectural metal louver system.



Proposed Airfield Typical Window Details



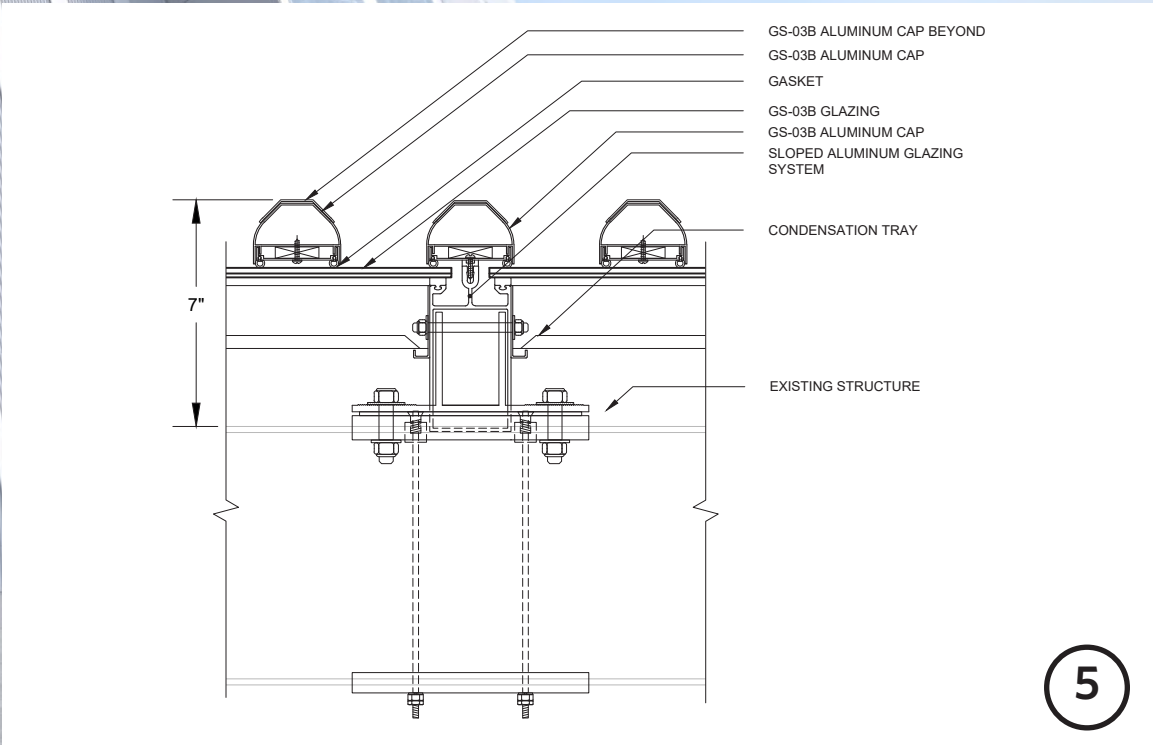
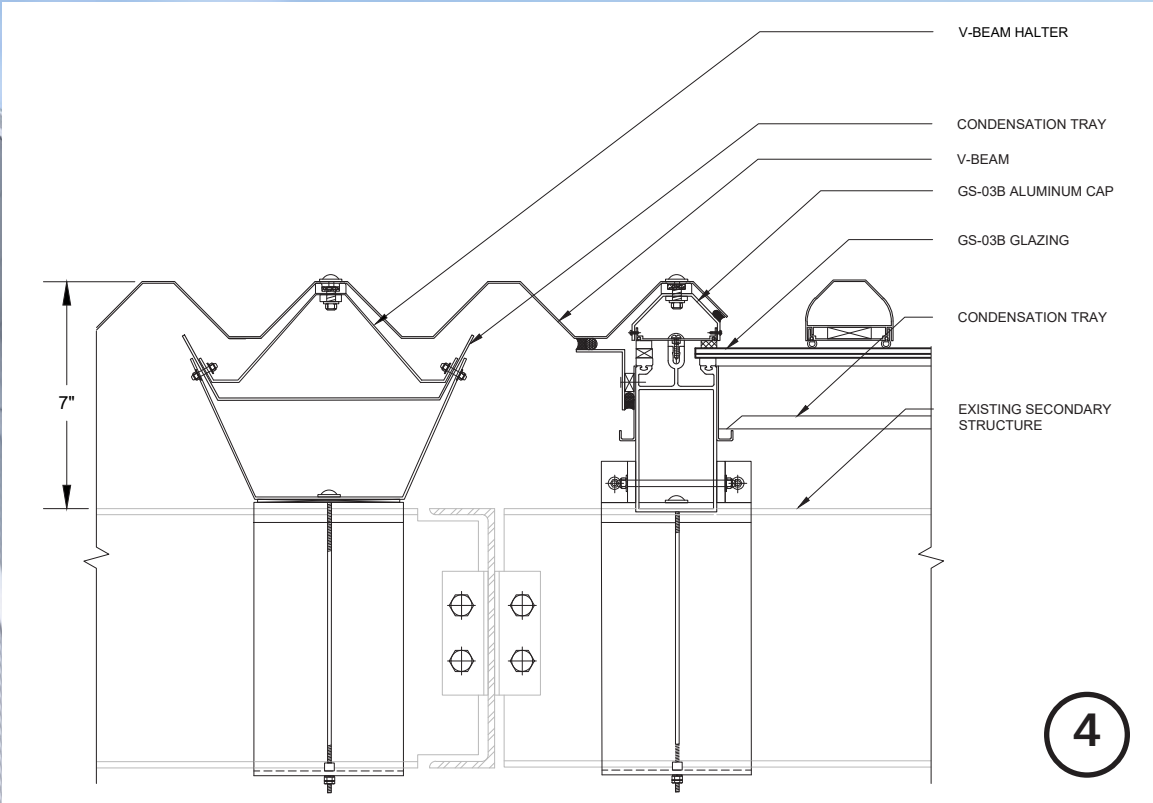
5

Proposed Typical Horizontal Detail

4

Proposed Typical Jamb Detail

The louver system will consist of a perforated V-Beam extrusion so that the expanded glass area is not typically visible from the exterior, and the size, shape, and pattern of the historic windows will remain visible



Proposed View from Airfield Side



Hangar 1 Interior Rehabilitation Approach

Interior Rehabilitation / Occupiable Upgrades Approach

**Original arrangement
of interior spaces:
Central volume
flanked by office and shop spaces**



Original Plan

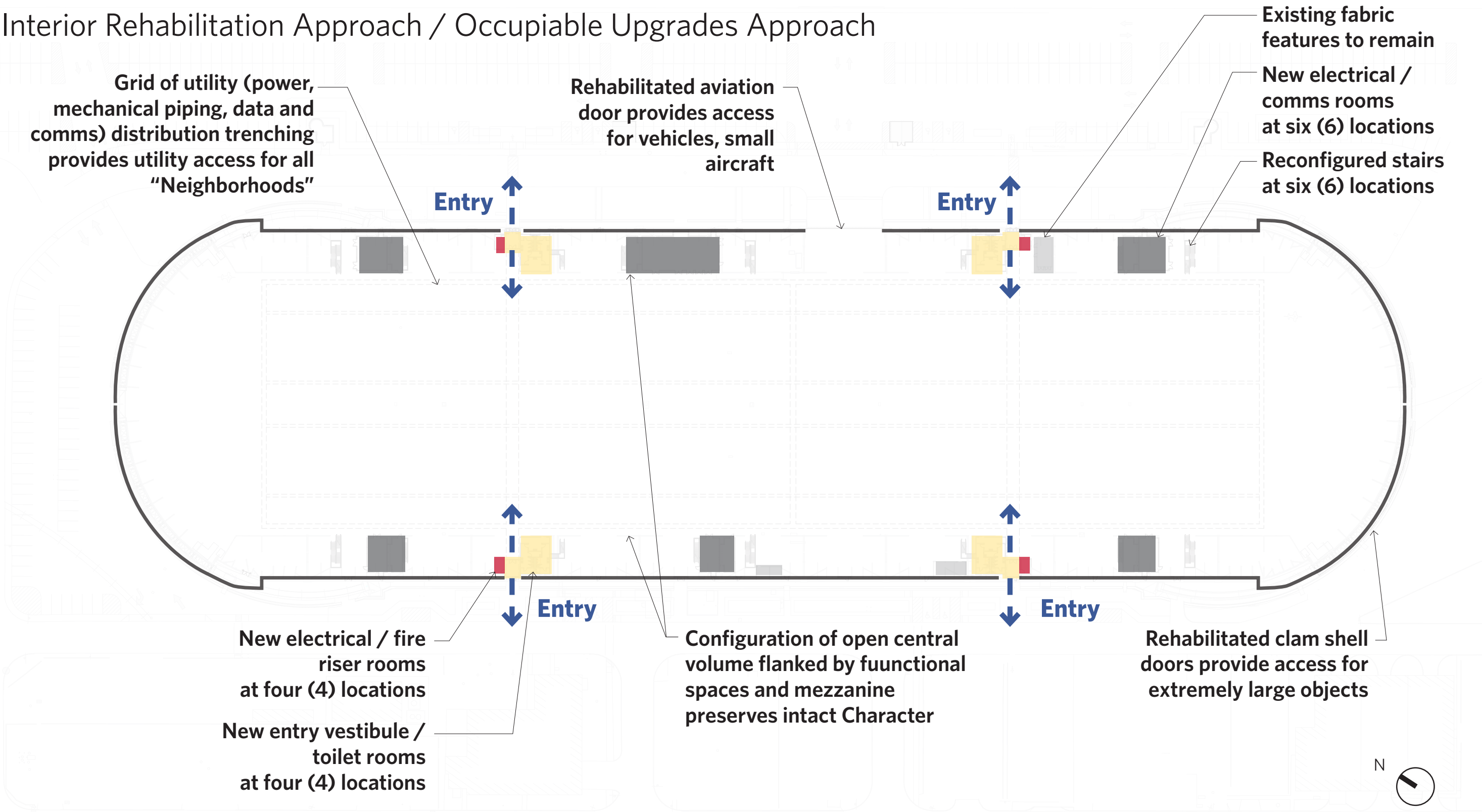
**Proposed arrangement
of interior spaces:
Central volume
flanked by office and shop spaces**



Proposed Plan



Interior Rehabilitation Approach / Occupiable Upgrades Approach



Typical Entrance Core

To maintain the overall visual effect of the hangar's interior, new entries will be located at building sides with structural frame exposed, as it was historically.



Rehabilitated Stair

New cast-in-place concrete cores containing building services will be constructed at multiple locations along the east and west sides of the building, under the mezzanine/level two; equipment will be screened from view by walls and / or parapets.



Rehabilitated Stair

Stairs will be reconstructed and reconfigured to provide required clearances and railings, using similar concrete and metal fabrications in similar locations as the originals, with finish colors easily distinguished from historic fabric.



Hangar 1 Interior Illumination Rehabilitation Approach

Interior Lighting

The original interior lighting scheme of Hangar 1 was designed to illuminate the cylindrical hull of the USS Macon from all sides. To provide illumination necessary for occupancy and maintenance, artificial illumination will be directed toward the ground floor surface.

**Original
illumination
target:
U.S.S. Macon**



**Proposed
illumination
target:
Hangar 1 occupied
ground floor level**

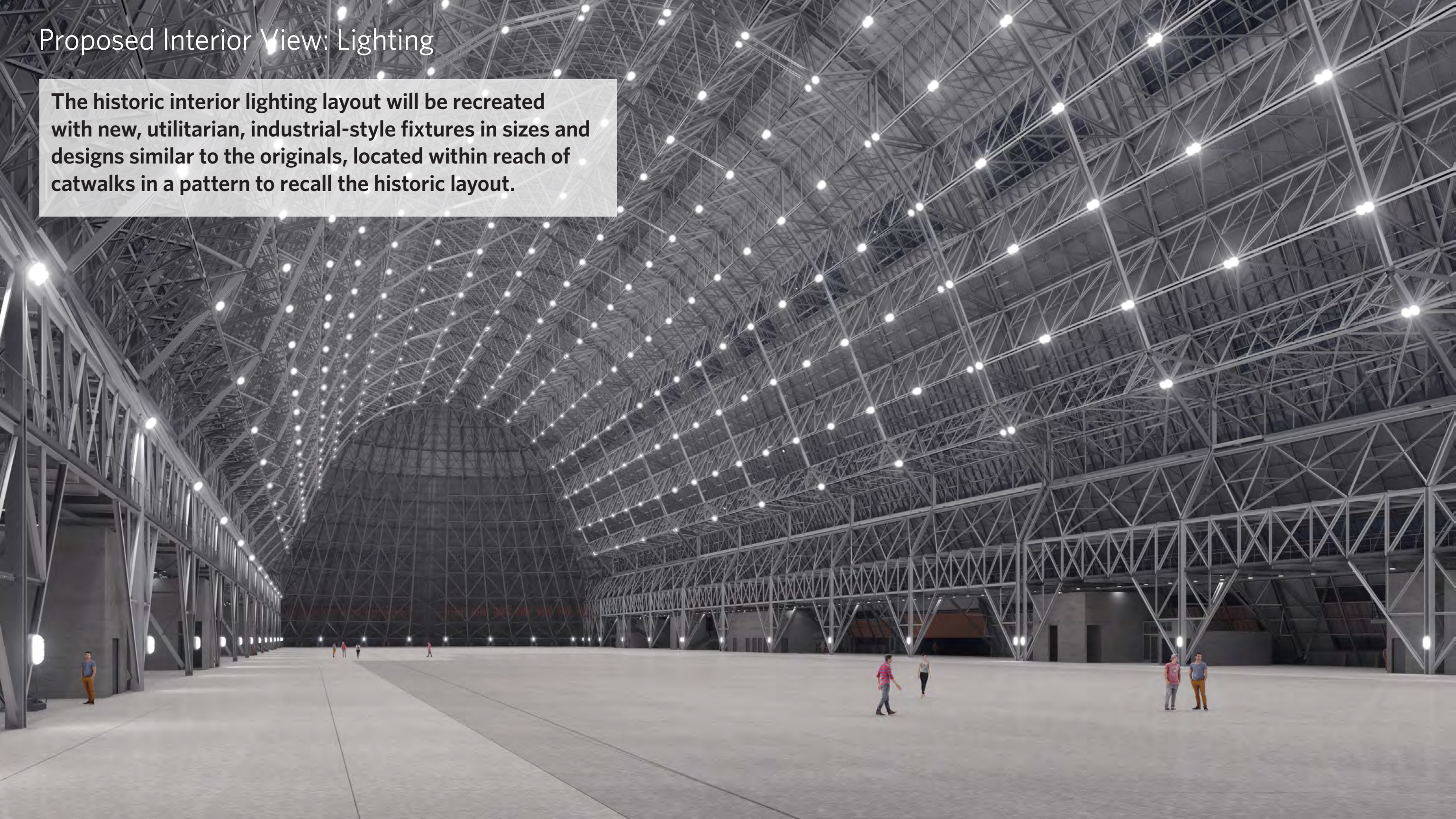


Hangar 1 Historic View: Interior



Proposed Interior View: Lighting

The historic interior lighting layout will be recreated with new, utilitarian, industrial-style fixtures in sizes and designs similar to the originals, located within reach of catwalks in a pattern to recall the historic layout.



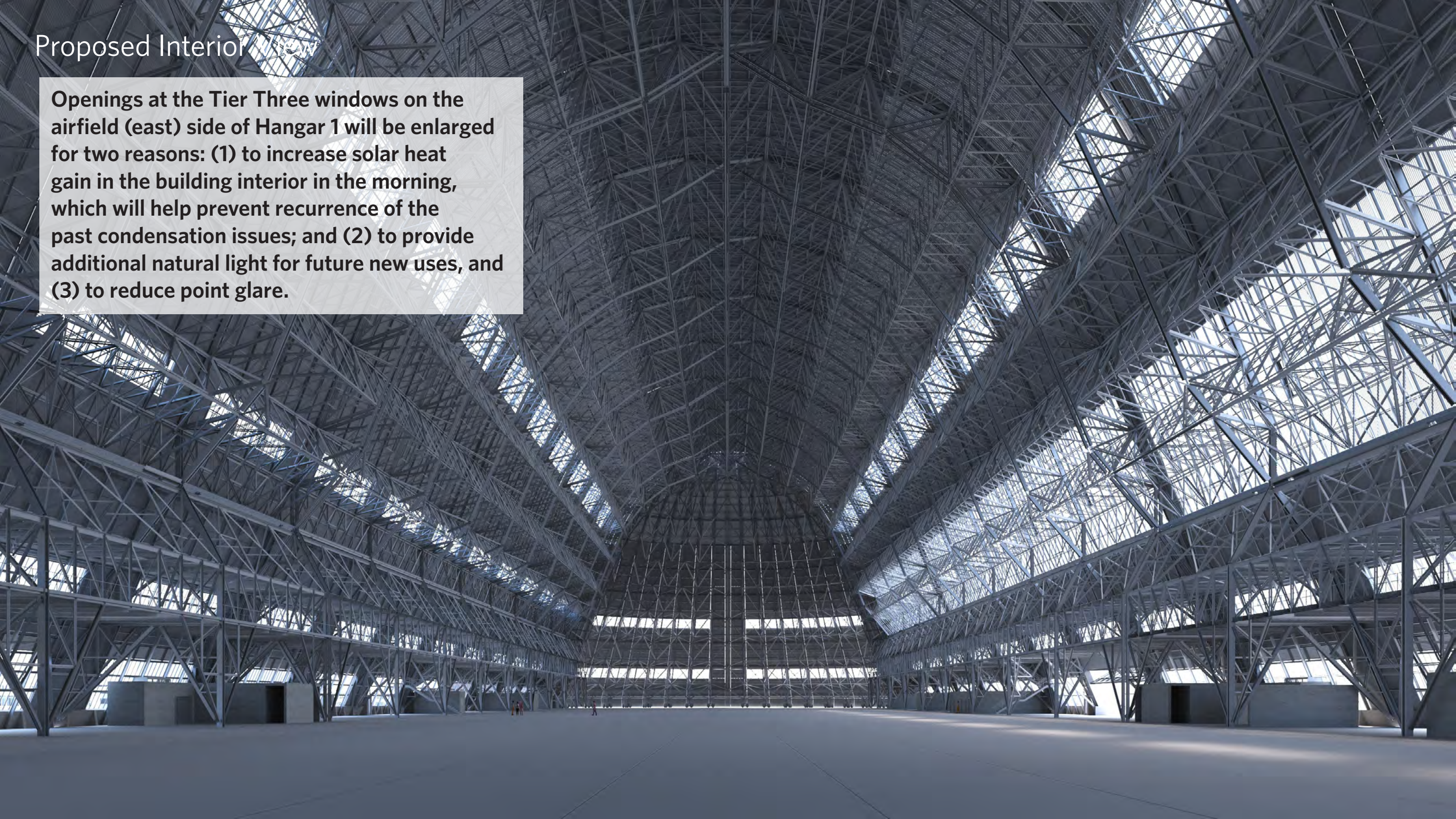
Hangar 1 Building Performance: Daylighting and Glare

Hangar 1 Historic View: Interior



Proposed Interior

Openings at the Tier Three windows on the airfield (east) side of Hangar 1 will be enlarged for two reasons: (1) to increase solar heat gain in the building interior in the morning, which will help prevent recurrence of the past condensation issues; and (2) to provide additional natural light for future new uses, and (3) to reduce point glare.



Hangar 1 Comparative Images, Historic and Proposed

Hangar 1 Historic View: Shenandoah Plaza



Proposed Shenandoah Plaza View



Exterior Aesthetic Lighting Concept

In-ground aesthetic uplighting will be installed around the perimeter of the building to wash the walls, and fixtures concealed on the monitor will wash the roof

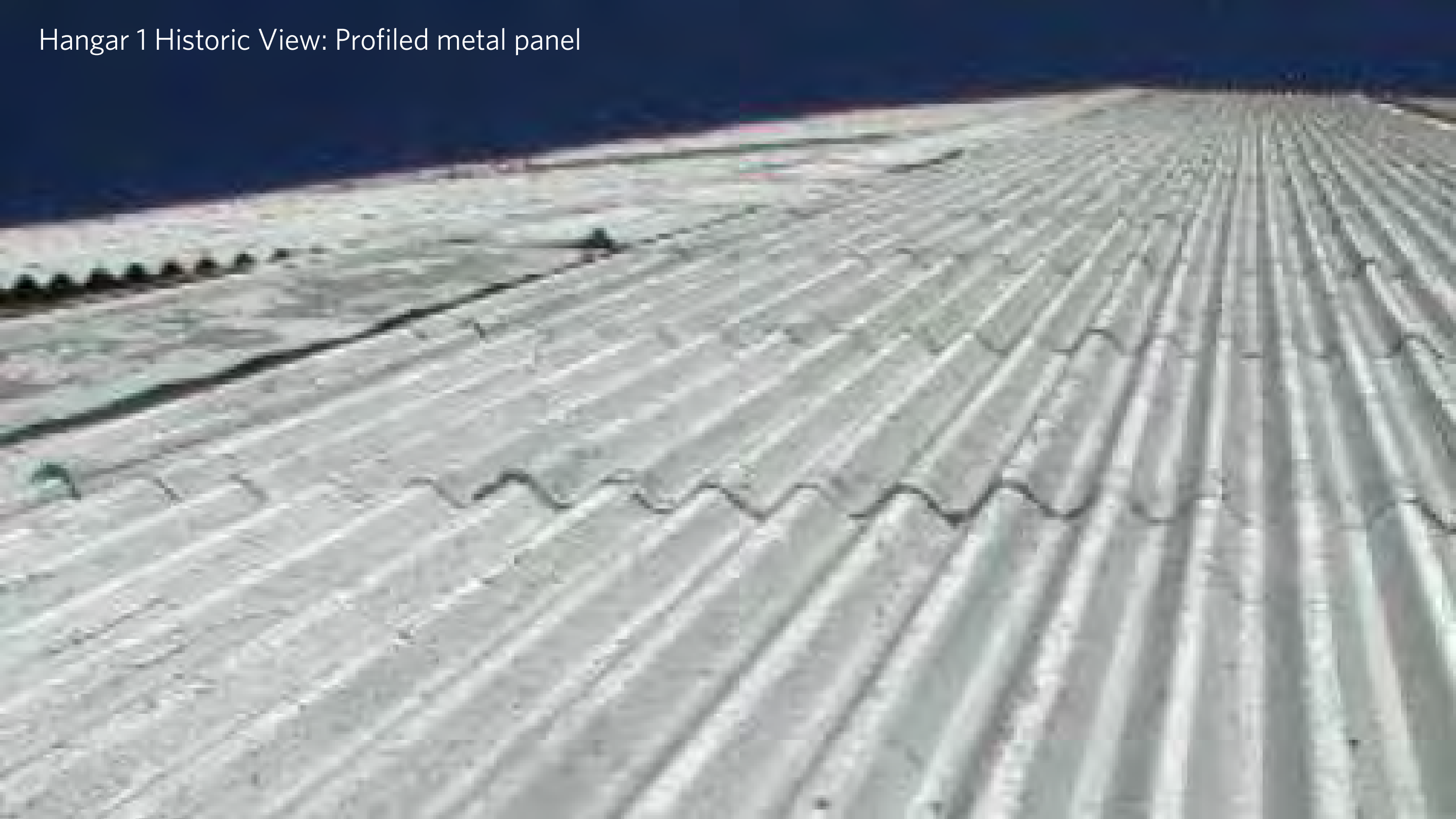


Exterior Aesthetic Lighting Concept

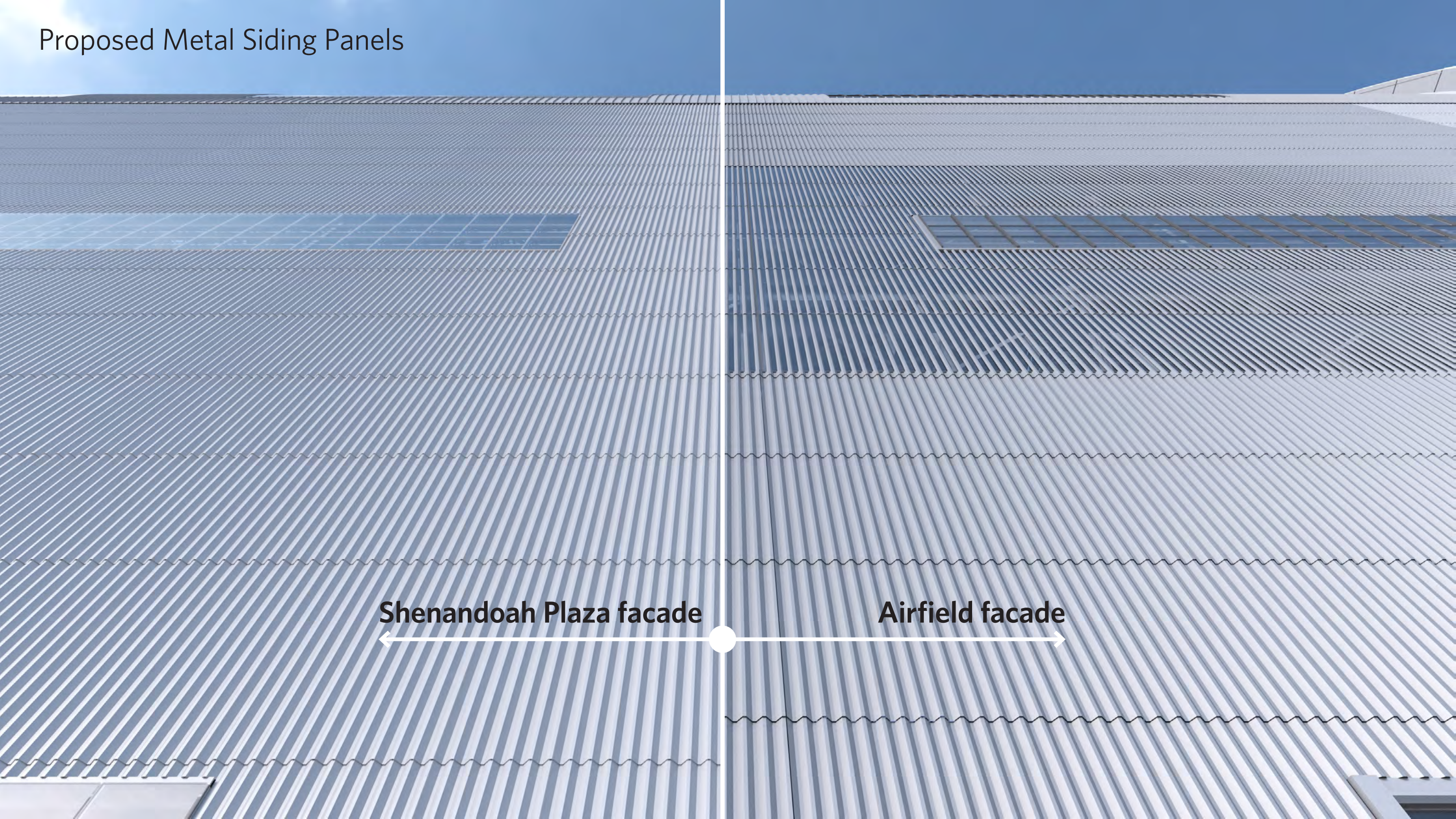
In-ground aesthetic uplighting will be installed around the perimeter of the building to wash the walls, and fixtures concealed on the monitor will wash the roof



Hangar 1 Historic View: Profiled metal panel



Proposed Metal Siding Panels



Shenandoah Plaza facade

Airfield facade

Hangar 1 HABS View:
Airfield



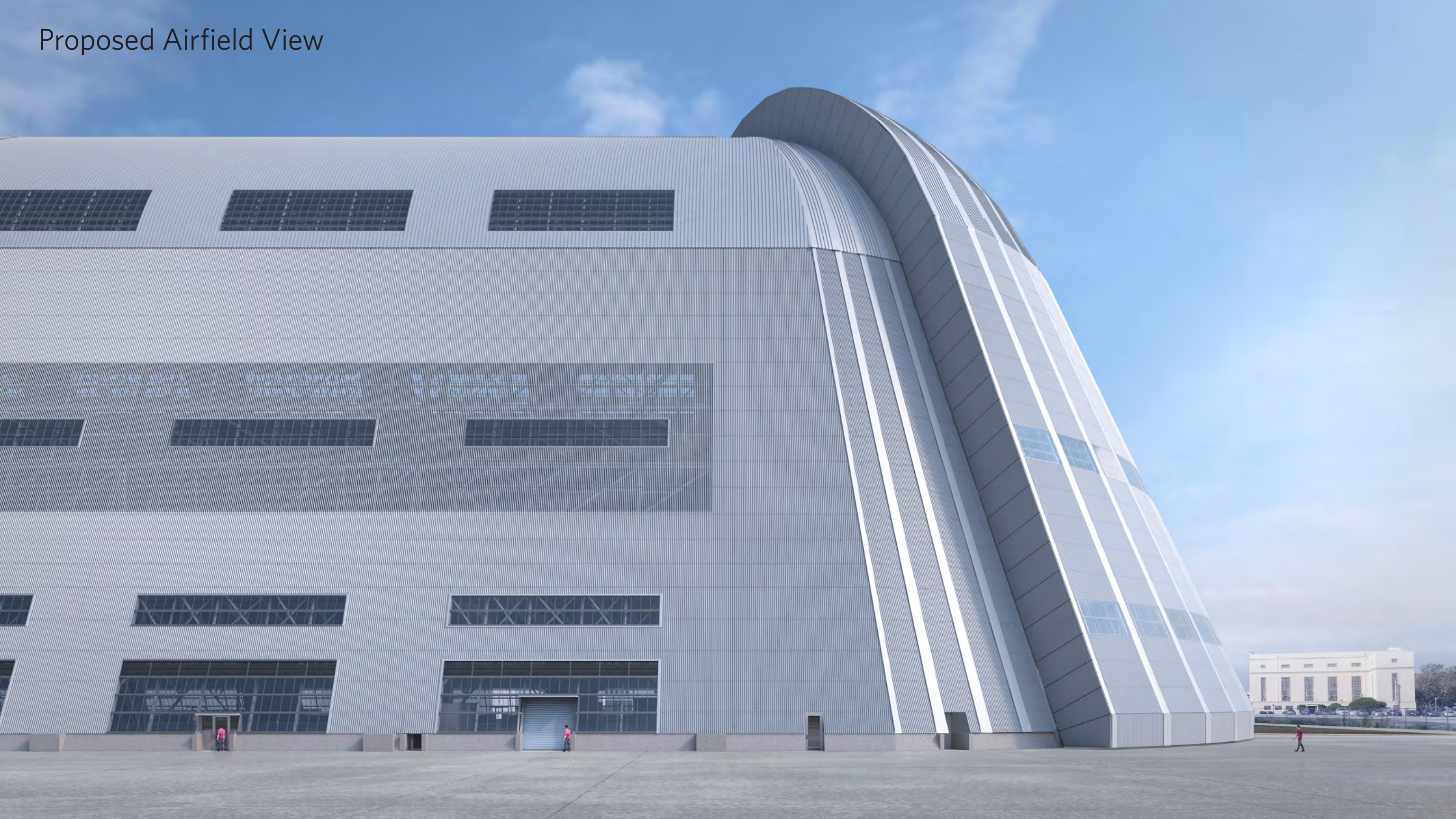
Proposed Airfield View



Hangar 1 HABS View: Airfield Facade



Proposed Airfield View



Hangar 1 HABS View: Window and Aviation Door Detail



Proposed Window and Aviation Door View



Hangar 1 View: Interior





Proposed Interior View

Hangar 1 Historic View: Shenandoah Plaza



Proposed View from Shenandoah Plaza



Hangar 1 Historic View: Shenandoah Plaza



Proposed View from Shenandoah Plaza



**Please direct formal comments regarding this presentation to
Jonathan Ikan, NASA Cultural Resources Manager
jonathan.d.ikan@nasa.gov**